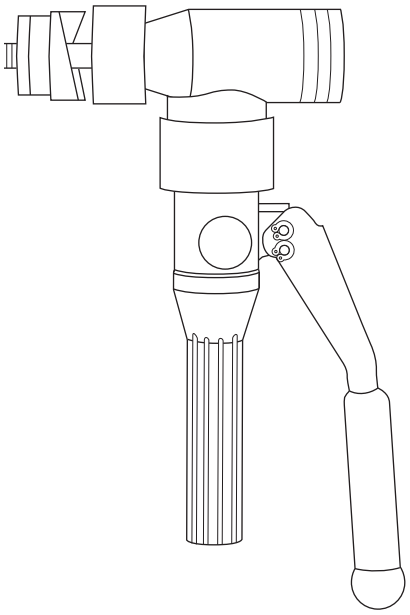
SERVICE MANUAL

GREENLEE®
A Textron Company



7904SB / 7906SB
Quick Draw 90®
Hydraulic Punch Driver

Serial Code ZA

Read and **understand** all of the instructions and safety information in this manual before operating or servicing this tool.

Register this product at www.greenlee.com

99947315 REV 1
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4/11

Table of Contents

Safety 2
Purpose of this Manual 2
Other Publications 2
Important Safety Information 3–4
Maintenance 5
Troubleshooting 6
Disassembly 7
Ball Seat Repair 7
Reassembly 8
Inspection and Adjustments 9
Illustration 10
Parts Lists 11
Draw Studs and Accessories 12

Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

Purpose of this Manual

This manual is intended to familiarize all personnel with the safe service procedures for the following Greenlee tool:

7904SB / 7906SB Serial Code ZA

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge at www.greenlee.com.

Other Publications

Instruction Manual: 99947307

All specifications are nominal and may change as design improvements occur. Greenlee Textron Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Quick Draw 90 is a registered trademark of Greenlee Textron Inc.

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KEEP THIS MANUAL

IMPORTANT SAFETY INFORMATION

SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

⚠DANGER

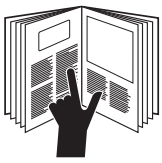
Immediate hazards which, if not avoided, WILL result in severe injury or death.

⚠WARNING

Hazards which, if not avoided, COULD result in severe injury or death.

⚠CAUTION

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.



⚠WARNING

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool. Refer also to the instruction manual, which is listed under “Other Publications.”

Failure to observe this warning could result in severe injury or death.

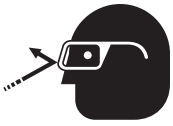
⚠WARNING

Electric shock hazard:

Do not use this tool near live circuits. This includes, but is not limited to, the following:

- Near circuit breaker panels or fuse boxes with energized circuits.
- Near junction boxes with energized circuits.

Failure to observe this warning could result in severe injury or death.



⚠WARNING

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection could result in serious eye injury from flying debris.

IMPORTANT SAFETY INFORMATION

⚠WARNING

- Inspect tool for wear or damage. Replace any worn, damaged, or missing components with Greenlee replacement parts. A damaged or improperly assembled tool can break and strike nearby personnel with sufficient force to cause severe injury or death.
- Inspect the punch, die, draw stud, and spacers for wear or damage. Replace any worn or damaged items with Greenlee replacement parts. Replace any punches that have dull cutting surfaces.

⚠WARNING

Do not exceed the rated capacity of this tool. Exceeding the rated capacity could cause a component failure, which could throw broken parts with great force.

Failure to observe this warning could result in severe injury or death.

⚠WARNING

Do not operate the pump lever after the ram motion stops. Continuing to operate the pump lever after the ram motion stops will damage the driver and could propel internal parts with great force, striking nearby personnel.

⚠CAUTION

Use this tool for the manufacturer's intended purpose only. Use other than that which is described in this manual can result in injury or property damage.

Note: Keep all decals clean and legible, and replace when necessary.

Maintenance

Maintenance and repairs should be performed in a dust-free area by qualified technicians.

This unit requires minimum maintenance because it has a closed hydraulic system and all internal parts are lubricated by the hydraulic fluid. Lubricate lever pins lightly. Keep contaminants away from the ram and cylinder. Store with the lever down and hydraulic pressure released.

Adding Hydraulic Oil

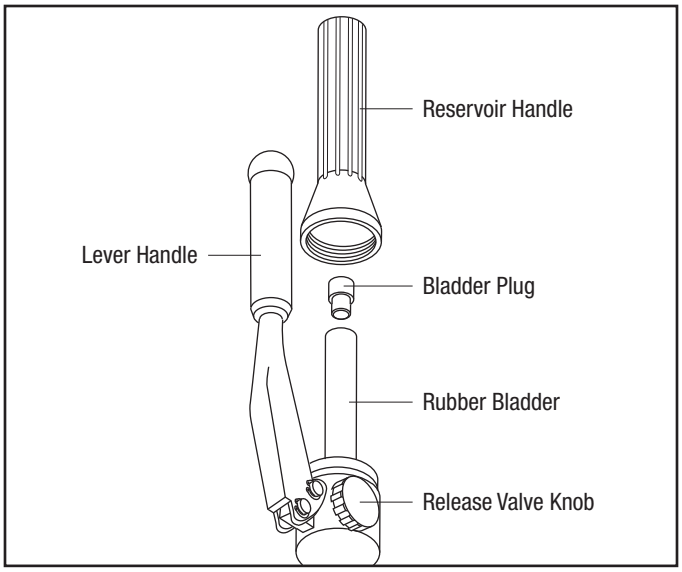
1. Place the driver in a vise in a vertical position with the handles up. Unscrew the reservoir handle and remove the bladder plug. Open the release valve knob to assure the ram is fully extended.
2. Fill the rubber bladder to the point of overflow with Greenlee hydraulic oil.
3. Purge air from the system:

   Pump the lever handle several times to remove air from the pumping chamber. Close the release valve knob and pump the lever handle until the ram completes its full travel. Repeat as necessary.

   Note: Open the release valve knob slowly so the ram extends slowly. Rapid return of oil and air may cause the oil to overflow the rubber bladder.

   If this procedure fails to remove air, remove the bladder plug and open the release valve knob. Place thumb over the plug hole in the bladder and squeeze the bladder while pumping the lever handle several times. Close the release valve knob and pump the lever handle until the ram completes its full travel. Repeat as necessary.

   If this procedure does not remove air, remove the plunger (24) and fill the plunger cavity with clean oil as described in the “Reassembly” section of this manual.
4. Fill the rubber bladder to the point of overflow and replace the bladder plug. Wipe the bladder clean of excess oil and reassemble the reservoir handle.



Oil Leaks

- Check for external oil leaks.
- Check that the release valve knob and stem are closed tightly and seating properly.
- Remove the reservoir handle and check for oil leaks around the rubber bladder and bladder plug.

Ram Section Will Not Rotate

1. Loosen and readjust the set screw (13).
2. Hold the punch driver with the ram section down.
3. Apply a small amount of penetrating oil to the cylinder (1) at the attachment point, and then work the ram section back and forth.
4. Apply a small amount of SAE 30 oil to the cylinder collar next to the pump block.

Troubleshooting

Problem	Probable Cause	Probable Remedy
Does not punch hole.	Improper assembly or use of punch, die, or accessories.	Refer to “Operation” and “Capacity and Draw Stud Selection Guide” in the Instruction Manual.
	Low oil level.	Refer to “Adding Hydraulic Oil” in the “Maintenance” section.
Requires excessive lever force.	Improper assembly or use of punch, die, or accessories.	Refer to “Operation” and “Capacity and Draw Stud Selection Guide” in the Instruction Manual.
	Material being punched is too thick or too hard.	Refer to “Capacity and Draw Stud Selection Guide” in the Instruction Manual.
Pump does not build pressure.	Air in system.	Refer to step 3 of “Adding Hydraulic Oil” in the “Maintenance” section.
Excessive number of strokes are required to punch hole.	Inoperative intake check valve.	Refer to “Intake Check Valve” inspection in the “Inspection and Adjustments” section.
	Inoperative discharge check valve.	Refer to “Discharge Check Valve” inspection in the “Inspection and Adjustments” section.
	Leaking release valve.	Refer to “Release Valve” inspection in the “Inspection and Adjustments” section.
	Damaged piston, piston extension, pump plunger seals, or mating surfaces.	Refer to “Maintenance,” cylinder and pump block sections.
	Clogged filter.	Clean or replace filter (40).
Does not return piston.	Weak or damaged return spring; excess oil in unit.	Refer to “Ram Travel Inspection” in the “Inspection and Adjustments” section.
External oil leaks.	Damaged piston, piston extension, pump plunger seals, or mating surfaces.	Refer to “Maintenance,” cylinder and pump block sections.
	Damaged release valve stem seal.	Refer to “Release Valve” inspection in the “Inspection and Adjustments” section.

Disassembly

Pump Section

Note: ***Separate ram section from pump section.*** *Remove set screw (13). Unscrew ram section from pump section.*

1. Remove reservoir handle (21) and bladder plug (20); drain oil from the bladder (29).
2. Remove O-ring (35) and the bladder (29). Remove retaining rings (37) from one end of both handle pins (30) and remove handle pins and handle (22).
3. Grasp plunger (24) with pliers; pull and twist to remove. Loosen set screw (12) from release valve knob (27); remove knob. Unscrew release stem (28) to remove from pump block (2). Remove oil filter (40). Unscrew inlet check seat (23) and remove ball (32) and spring (31). Unscrew jam screw (26). Remove spring (39) and ball (6).

Ram Section

Note: Refer to illustration on the next page.

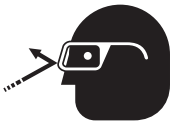
1. Thread an installation rod into the tapped hole in ram (3). Place a flat washer and threaded hex nut on the installation rod. Tighten the nut until the spring retaining plate (4) is no longer applying force against the retaining rings (5).
2. Remove the retaining rings (5) from the installation rod and remove the spring retaining plate (4) and compression spring (7).
3. Screw a draw stud into end of ram (3); push the ram out of the cylinder (1).

You have now disassembled the punch driver. Thoroughly clean all parts and inspect the three ball seats (intake, discharge, and release stem) for nicks, scratches, or other damage.

Ball Seat Repair

Re-seating

Minor seat imperfections may be corrected by re-seating. Use a soft brass rod and hammer to tap the ball against its seat.



⚠WARNING

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection could result in serious eye injury from flying debris.

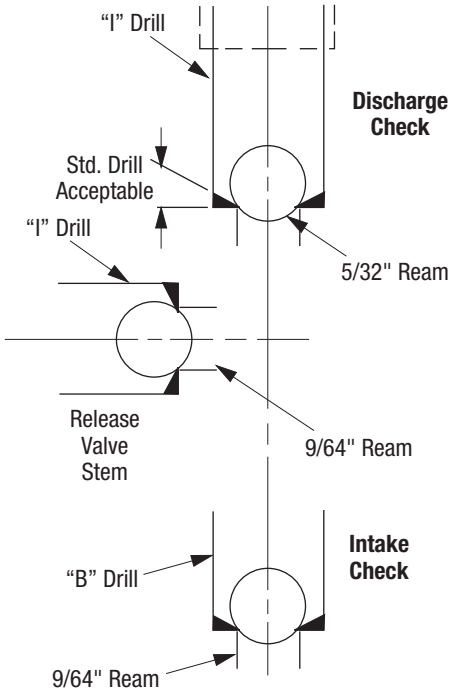
Re-drilling

Badly worn or damaged seats may be reworked by re-drilling and then re-seating.

The pump block is manufactured with seats of 118°, the standard drill point angle; use standard drills for re-drilling.

- To re-drill the 7/32" ball seat for release stem (28): Use an “I” drill and a 9/64" diameter reamer.
- To re-drill the 7/32" ball seat for the discharge check: Use an “I” drill and a 5/32" diameter reamer.
- To re-drill the 3/16" ball seat for the intake check: Use a 1/4" drill and a 1/8" diameter reamer.

When drilling, remove a minimum of material to obtain maximum seat life. Re-seat the balls before reassembly.



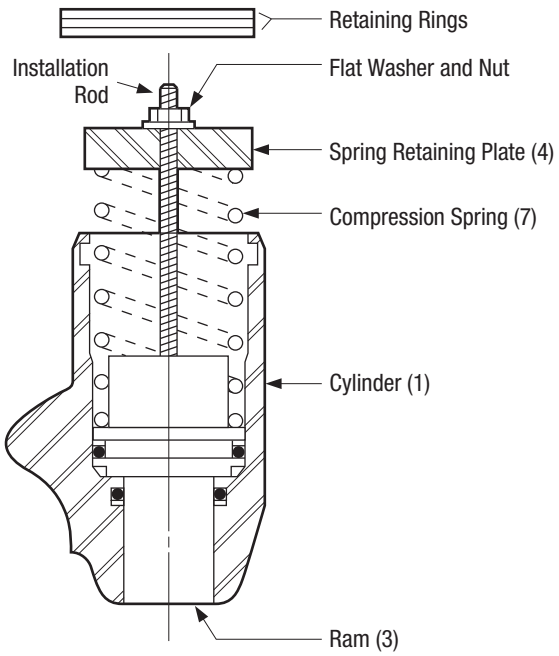
Reassembly

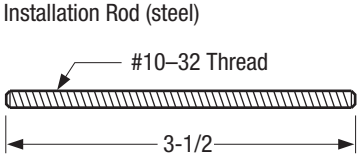
Reassembly is done in reverse sequence of disassembly.

Use repair kit 50383159 to replace all O-ring seals, balls, and springs.

Ram Section

1. Lightly coat ram (3) and cylinder (1) seals and both bores of the cylinder with clean oil.
2. Push ram completely into cylinder.
3. Thread installation rod into tapped hole in the ram and install compression spring (7). Place spring retaining plate (4) on top of spring (7) so the installation rod passes through the 1/4" hole in the retaining plate.
4. Place a flat washer and thread a hex nut on the installation rod. Tighten the nut until spring retaining plate slides past the retaining ring groove. Install the two retaining rings (5) 180° apart. Remove installation rod.





Pump Section

Fill plunger (24) bore with clean hydraulic oil. Coat O-ring seals on plunger with clean oil and reinsert the pump block (2) with release valve knob (27) closed.

Ram Section to Pump Section

1. Install drive pin (25) to the pump block (2).

   Note: The drive pin must be installed to less than 0.100" high.
2. Lightly coat the O-ring groove on the pump block and O-ring (14) with clean oil. Assemble O-ring (14) and backup ring (15) to pump block (2).
3. Apply a light coat of grease (Molycote G) to the external threads of pump block (2). Make sure the O-ring (14) and backup ring (15) are lightly coated with oil. Carefully slide the cylinder (1) onto the pump block.
4. Thread the cylinder onto the pump block until it bottoms. Back off the cylinder until set screw (13) can be installed and still allow nearly 360° of rotation.

   *Note: Repeat step 4 if cylinder is backed off more than **one** revolution.*
5. Apply Loctite® 242® or equivalent to set screw (13) and install until set screw bottoms. Then back out 1/8 to 1/4 turn.
6. Fill unit with clean oil and purge air. Refer to “Adding Hydraulic Oil” in the “Maintenance” section.

Inspection and Adjustments

After reassembly, check the following:

Ram Travel Inspection

Ram Extended

With the draw stud removed and release valve knob open, observe whether end of ram (3) is flush to 1/64" (0.396 mm) below the end of cylinder (1). If it is not, the bladder (29) contains too much oil.

To remove excess oil:

1. Remove reservoir handle (21) and bladder plug (20).
2. Slowly open release valve knob (27); excess oil should come out of the bladder and the ram should move to become flush to 1/64" (0.396 mm) below the end of the cylinder (1).
3. If excess oil does not come out, replace the compression spring (7).

Ram Retracted

Measure ram travel distance (difference between ram completely extended and completely retracted). Distance is 0.830" (21.1 mm) to 0.930" (23.6 mm).

Pump Section Inspection

Intake Check Valve

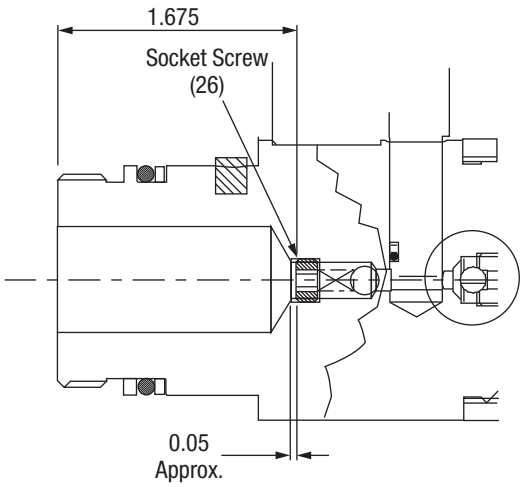
Close the release valve knob and operate handle (22) until ram (3) bottoms and handle resistance increases.

- If the ram bottoms in 30 strokes or less, the inlet check valve (32 and 23) is operating properly.
- More than 30 strokes indicates an inlet check leak. Re-seat, re-drill, or replace the inlet check seat (23).

Discharge Check Valve

If the handle (22) returns to the raised position by itself, the discharge check valve is leaking. Re-seat or re-drill the discharge check seat and replace the compression spring (39).

Install socket screw (26) to depth shown. If screw is bottomed out, ball cannot move and Quick Draw handle will not pump.



Release Valve

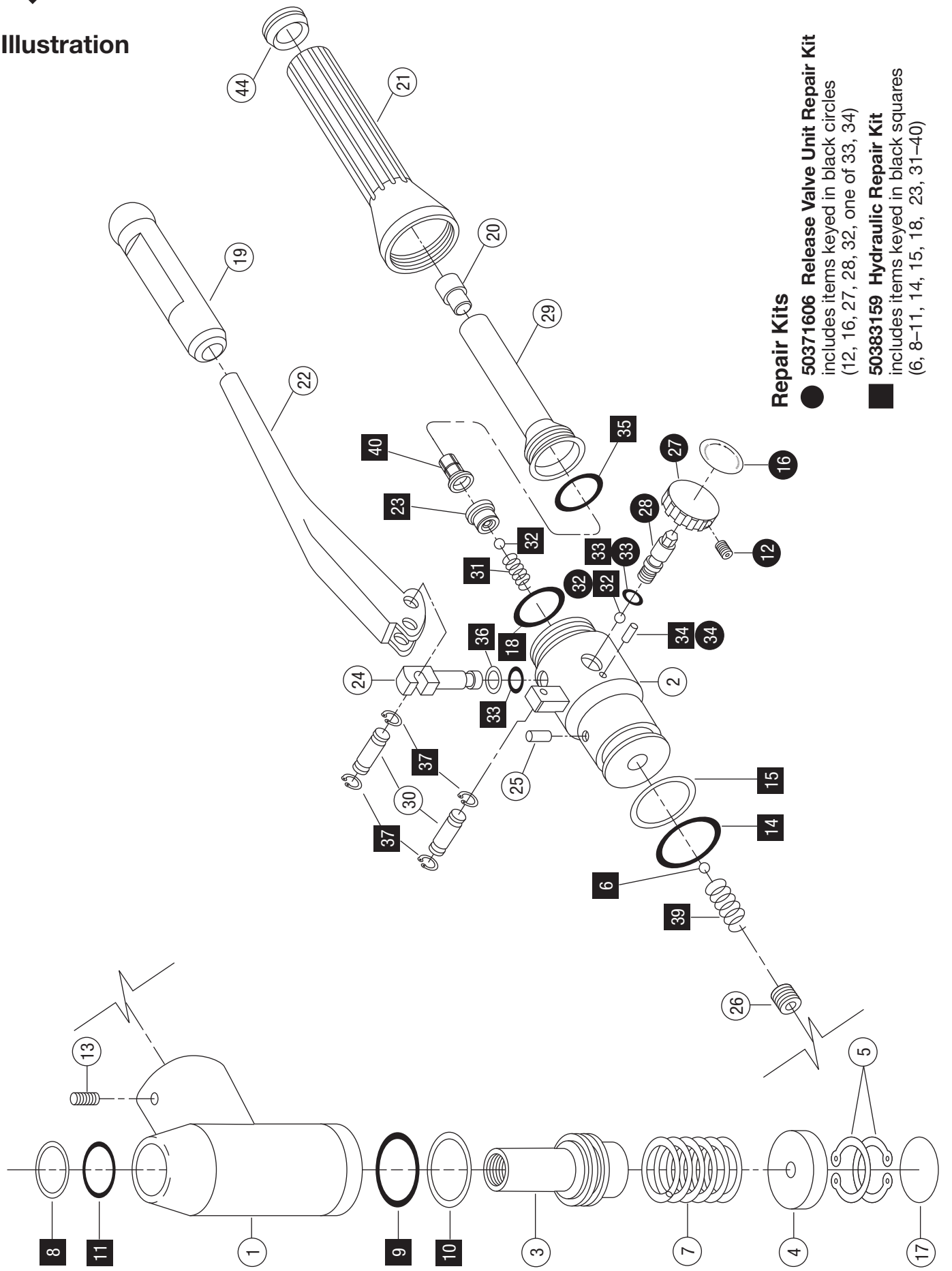
Pump the handle until the ram bottoms. Gently apply and maintain additional force on handle (22). If the handle remains solid, the ball (32) is operating properly. If the handle (22) goes down slowly, the release valve is leaking. Re-seat or re-drill the release stem seat and replace O-ring (33).

Cylinder Rotation

Install a 3/4" draw stud and a 2" conduit size punch and die to the punch driver. Hold the driver by the reservoir handle (21) so the draw stud is horizontal; the cylinder should not rotate from the combined weight of the draw stud, the punch, and the die. If rotation occurs, O-ring (14) may be worn.

If binding or roughness occurs during cylinder rotation, check for lubrication or damage at threads closest to set screw (13); also check adjustment of set screw (13).

Illustration


Repair Kits
● 50371606 Release Valve Unit Repair Kit
includes items keyed in black circles
(12, 16, 27, 28, 32, one of 33, 34)
■ 50383159 Hydraulic Repair Kit
includes items keyed in black squares
(6, 8–11, 14, 15, 18, 23, 31–40)

Parts List

Key	Part No.	Description	Qty
1	50369148	Cylinder, angle driver	1
2	50369172	Block, pump	1
3	50369040	Ram, right angle driver	1
4	50369156	Plate, spring retaining	1
5	90518098	Retaining ring, 1.75 Truarc internal	2
6	90504526	Ball, steel, .218 diameter	1
7	50339079	Spring, compression, 1.34 x 1.65 x 1.76	1
8	90538471	Backup ring, spiral, 1.00 x 1.24 x .027 Teflon	1
9	90513169	O-ring, 1.50 x 1.75 x .125 nitrile	1
10	90538498	Backup ring, spiral, 1.50 x 1.74 x .027 Teflon	1
11	90513304	O-ring, 1.00 x 1.25 x .125 nitrile	1
12	90510321	Screw, set, #8–32 x .187 socket cup point	1
13	90508815	Screw, set, 1/4–28 x .250 socket	1
14	90508971	O-ring, 1.37 x 1.62 x .125 nitrile	1
15	90508963	Backup ring, spiral, 1.37 x 1.62 x .121	1
16	50318780	Decal	1
17	50343017	Decal, identification	1
18	90511301	O-ring, 1.50 x 1.62 x .062 nitrile	1
19	50232584	Grip, .600 x 1.00 x 4.50	1
20	50324888	Plug, bladder	1
21	50368893	Handle, reservoir	1
22	50368877	Handle, pump	1
23	50368907	Seat, inlet check	1
24	50377159	Plunger	1
25	90538633	Pin, drive, .218 x .312	1
26	90513371	Screw, jam, 5/16–24 x .156 socket	1
27	50368869	Knob, release valve	1
28	50368931	Stem, release	1
29	50342690	Bladder, rubber	1
30	50377140	Pin, handle	2
31	50342878	Spring	1
32	90506782	Ball, steel, .187 diameter	2
33	90538544	O-ring, .250 x .375 x .062	2
34	90504585	Pin, roll, .125 x .375	1
35	90517415	O-ring, 1.31 x 1.56 x .125 nitrile	1
36	90542304	Backup ring, spiral, .265 x .052 Teflon	1
37	90541863	Retaining ring, .217 Truarc external	4
39	90538455	Spring, compression, .152 x .180 x .380	1
40	52059251	Filter, oil	1
44	50368940	Cap, reservoir handle	1

Draw Studs and Accessories

Cat. No.	Part No.	Description	Qty
29451	50294512	Draw stud, 7/16" stainless steel (optional)	1
31872	50318721	Draw stud, 3/4–16 x 4.12	1
1924AA	50332488	Spacer, .767 x 1.37 x .875	1
1614SS	50300431	Screw, 3/8" short adapter	1
33967	50339672	Adapter, stud, 3/8–24 x 3/4–16	1

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